

Human Computer Interaction

CS449 – CS549

Week-1

Course Logistics

Introduction: What is HCI and why is it important?

KÜRŞAT ÇAĞILTAY

Coaches

- Head coach: Kürşat Çağıltay

 - FENS 2073;
 - kursat.cagiltay@sabanciuniv.edu
 - Office hours: By email/appointment or walk-in
- Assistant coach: Faraz Badali Naghadeh,
 - faraz.badali@sabanciuniv.edu
 - Office hours: Tuesday 11:00-12:00 – Wednesday 14:00-15:00
 - FASS G012 (HCI Lab)

About me

- METU/ODTÜ : Mathematics - Computer Engineering,
- Indiana University, USA. Double Ph.D.
 - Instructional Technology & Cognitive Science
- I have been teaching/researching HCI in the last 20+ years

My Research Focus: Human Computer Interaction

- Eyetracking
- Virtual/Augmented/Mixed Reality Immersive Technologies
- Technology Enhanced Learning
- Computer Games/Simulations
- Interactive Wearable Technologies/Tangible Objects



Aim of the Course

- Provide a sound background to the discipline of HCI
- Examining and applying HCI research to the design and evaluation of interactive systems
- Gaining transdisciplinary approach with, technical, psychological and social focus
- Paradigm shift towards human centered computing

Key Objectives

- Provide a foundation of understanding about HCI issues in software engineering
- Develop valid and reliable usability evaluation plans for any information technology
- Develop a theoretical and empirical understanding of user-centered design of computer interfaces, and their uses,
- Offer a set of first-hand real-world experiences which augment conceptual understanding of course content
- Social, psychological, and ethical issues of HCI

Use and Context

U1 Social Organization and Work



U3 Human-Machine Fit and Adaptation

U2 Application Areas

Human

H1 Human Information Processing

H2 Language, Communication and Interaction

H3 Ergonomics

Computer

C2 Dialogue Techniques



C1 Input and Output Devices



C3 Dialogue Genre



C4 Computer Graphics



C5 Dialogue Architecture



D3 Evaluation Techniques

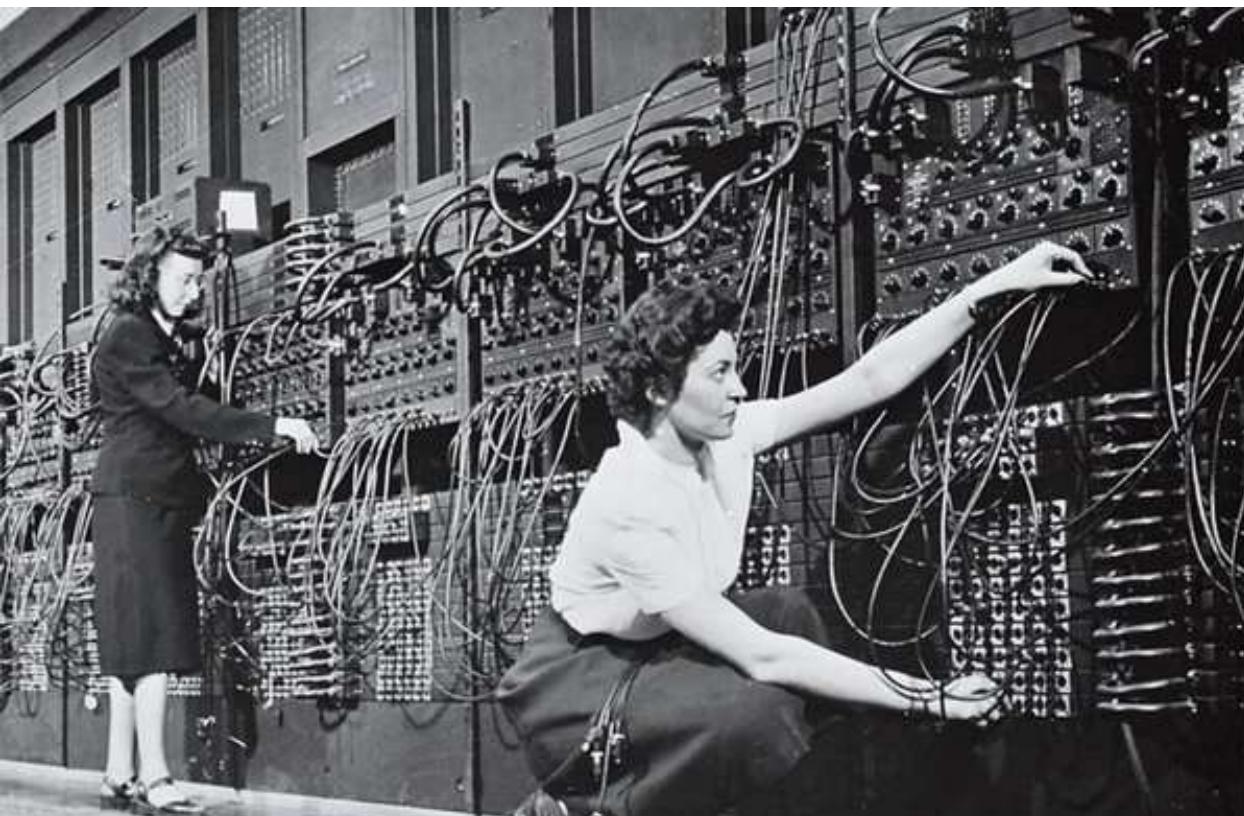
D4 Example Systems and Case Studies

D2 Implementation Techniques and Tools

D1 Design Approaches

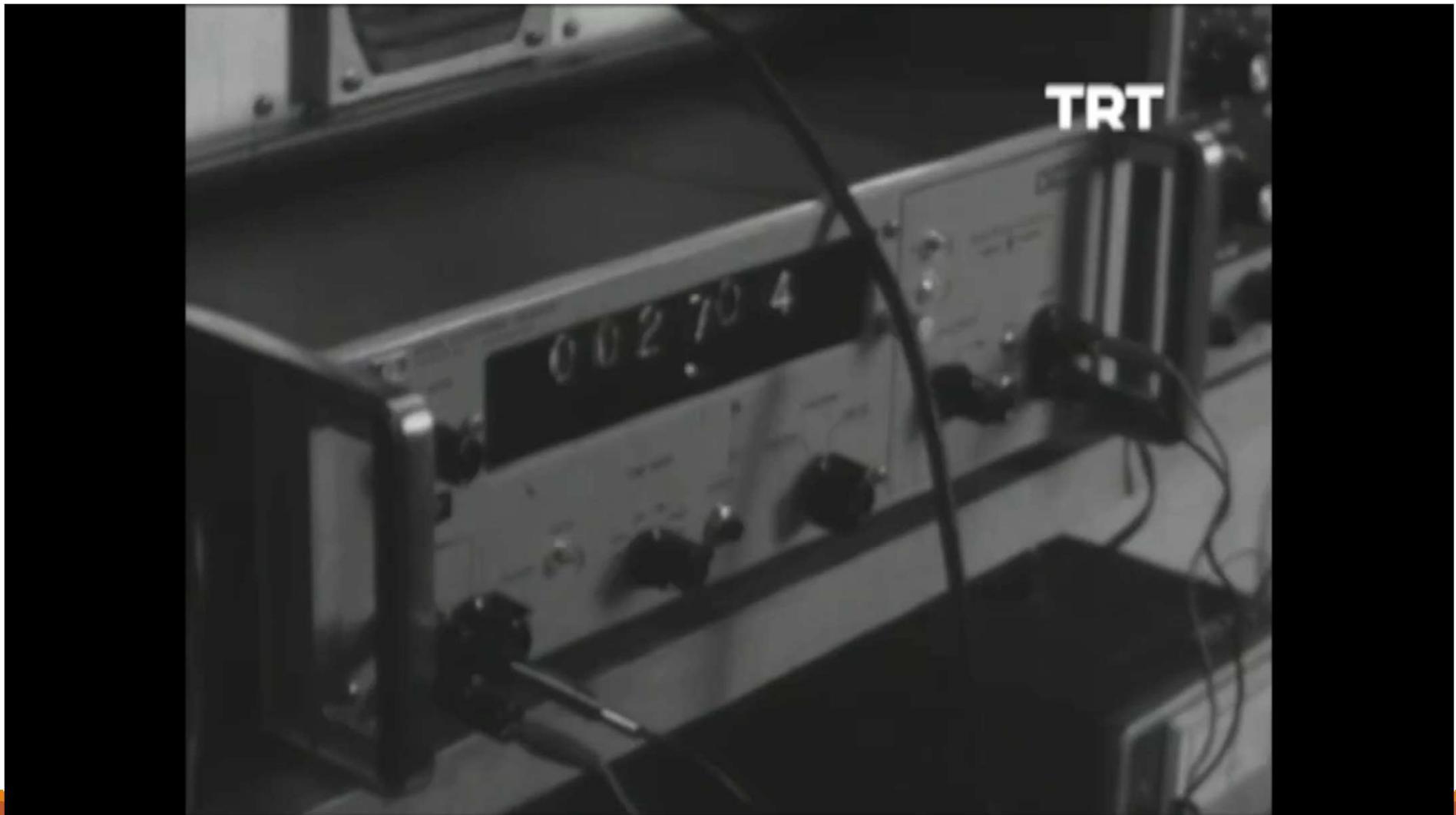
Development Process

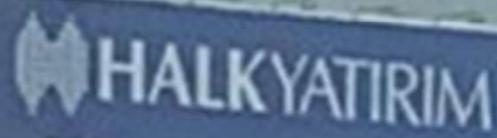
HCI Long Time Ago





- The first step in giving a program to a computer is the punch card process (1973)
- <https://youtu.be/j40aWPW2OO8>





HALKYATIRIM Çok dijital, çok kolay!

Yatırım yapmayı kolaylaştıran yenilikçi mobil
uygulamalar ve dijital işlem kanalları
Halk Yatırım'da!

halkyatirim.com.tr



Easy to Use? For Whom?





Human Computer Interaction by Cem Yılmaz



CM101
F U N

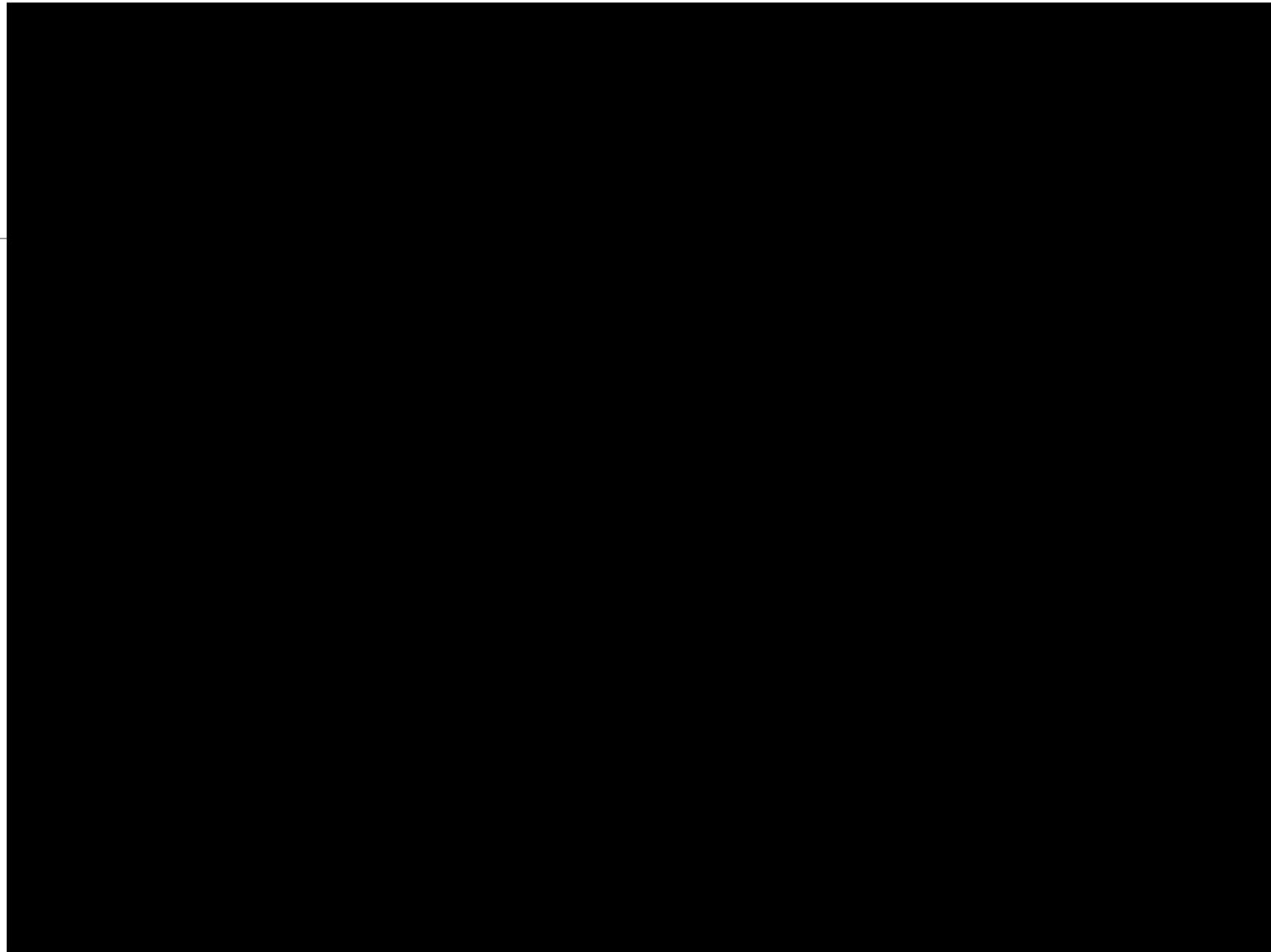
cmylmz.com

facebook.com/cmylmz

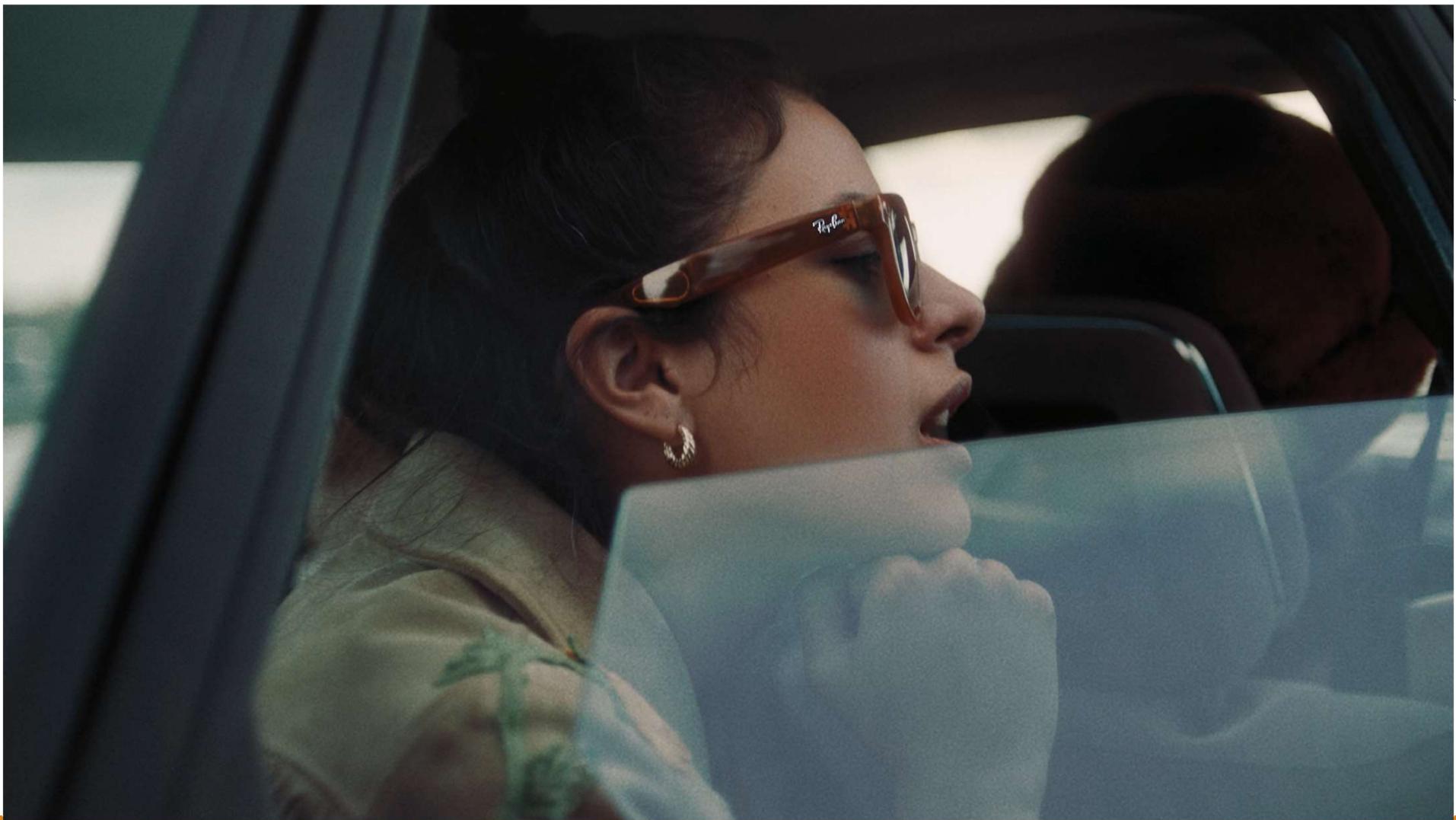
twitter.com/cmylmz

youtube.com/cmylmz

google.com/+cmylmz



Transformation of Interaction



Students' Primary Responsibilities

- Making weekly readings ☺
- Doing and Turning in assignments
- critiquing and analyzing readings, finding related case studies/hands-on experiences, and organizing and participating class discussions.
- in-class and outside of class assignments/exercises to link with concepts covered in class
- Conduct HCI Research
- Publish

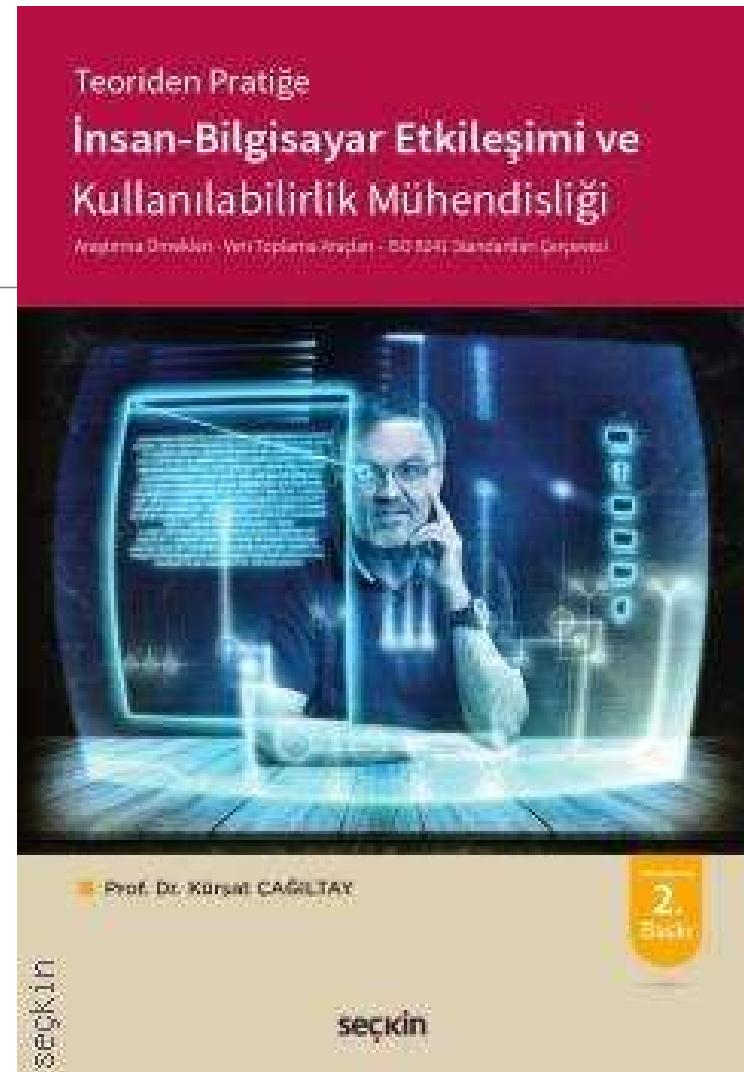
My Role/Responsibilities

- Providing learning sources for students
 - Sharing my experiences
 - More «Guide on the side», Less «sage on the stage»
 - Coaching rather than instructing
 - Grading ☹
-
- Process/Play oriented



Course Materials

- Reading package will be used.
- Required and optional readings will be available on SUCLASS
- If you need an HCI book in Turkish (not required)



Courseware Material in Turkish

- kullanilabilirlik.info/

English

İnsan Bilgisayar Etkileşimi

Home / Courses / Education / Computer Education and Instructional Technology / İBE

Bu ders malzemeleri TUBITAK 5000 Açık Ders Kaynakları 215B079 nolu proje kapsamında oluşturulmuştur.

Öğretim Üyesi: Prof. Dr. Kürşat ÇAĞILTAY
Ders Kitabı: Teoriden Pratiğe İnsan – Bilgisayar Etkileşimi ve Kullanılabilirlik Mühendisliği
<https://www.seckin.com.tr/kitap/292198311#>



The image shows the front cover of a textbook. The title 'Teoriden Pratiğe İnsan – Bilgisayar Etkileşimi ve Kullanılabilirlik Mühendisliği' is displayed at the top in white text on a dark red background. Below the title, there is a small line of fine print. The main part of the cover features a photograph of a man with glasses, wearing a blue shirt, sitting in front of a computer monitor. The monitor displays some code or data. The background of the cover is a dark blue color with some abstract light patterns.

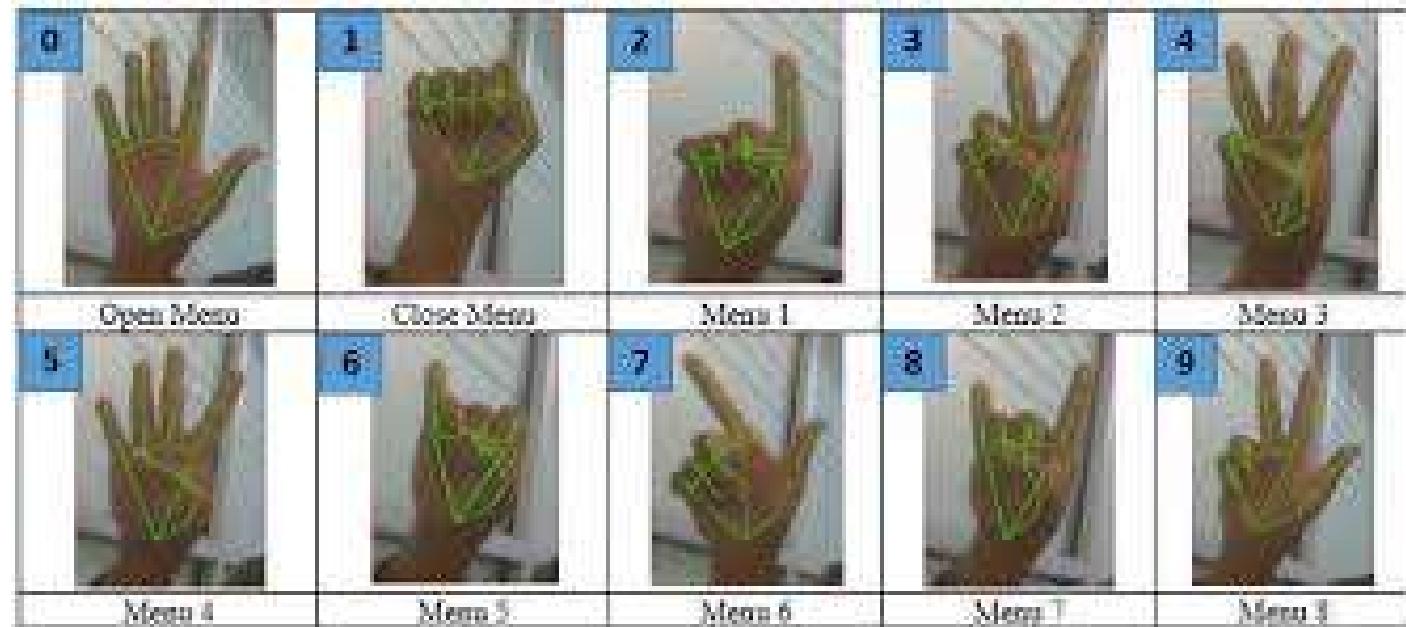
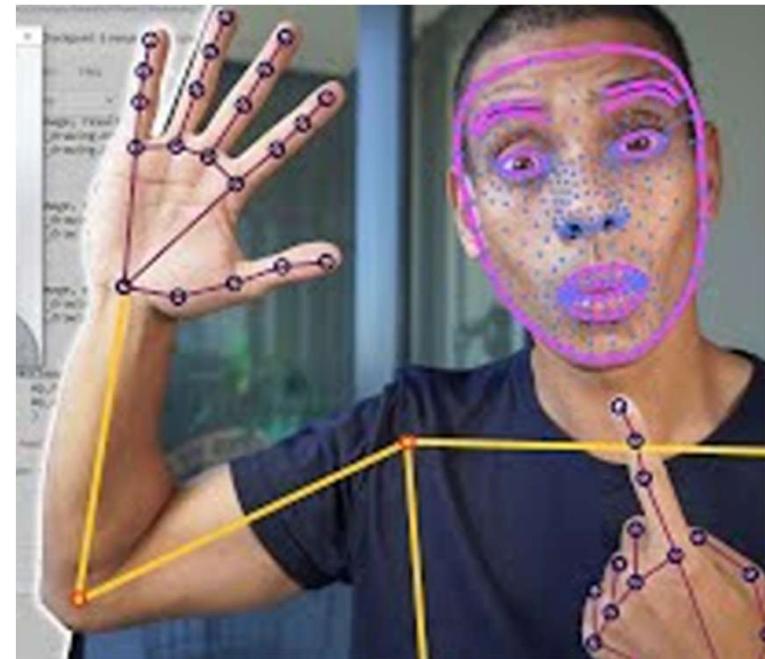
WEEKLY PROGRAM – (Tentative)

1. Introduction: What is HCI and why is it important?
2. From interface to interaction: HCI Theories, frameworks
3. What is a good user interface: Guidelines, Styles, and Evidence
4. Usability engineering
5. Beyond usability engineering: Understanding the user (part 1) Human Cognition
6. Beyond usability engineering: Understanding the user (part 2) Perception
7. Evaluation strategies for usable interface design: Cognitive Modeling
8. Evaluation strategies for usable interface design: Heuristic Evaluation and Cognitive Walkthrough
9. Evaluation strategies for usable interface design: User based testing & eye tracking
10. HCI Research Methods: Quantitative and qualitative
11. UI Prototyping & Wireframes, Personas, Use Scenarios, and Storyboards
12. Software engineering methodologies and User-Centered Design
13. Accessibility, Interaction and cutting-edge technologies: XR, BCI, HRI
14. HCI and Ethics in the design of information systems for users

Assignments And Grades (Tentative)

- Assignment-1 Design diary report (with redesign – Figma) = 5 pts
- Assignment-2 Laws of HCI (Fitt's Law) = 5 pts
- Assignment-3 Cognitive Modeling Assignment = 10 pts (This assignment requires CogTool cognitive modeling software, make sure it works on your own computer: <https://www.cogtool.org/>)
- Assignment-4 Heuristics Based Usability testing = 13 pts
- Assignment-5 Development of a Gesture-based interaction using Mediapipe = 10pts
- Assignment-6 End User Based Usability testing = 10 pts
- Final Project / Term Paper (Group) = 42 pts (3 pts proposal, 39 pts final paper,
- Peer evaluation=2 pts
- Participation/Attendance (with mini quizzes) = 3 pts

Assignment-5 Development of a Gesture-based interaction



AI use policy

- All work must be done by students.
- AI use in assignments is prohibited.
- The only exception is proofreading.
- Assignments will be checked by Turnitin for plagiarism and AI use.

Previous Years' Students



- CS 449 Term paper
- Presented in HCI conference, USA

MagniVR: DESIGN & ANALYSIS OF LOW VISION ACCESSIBILITY TOOL FOR VIRTUAL REALITY

*Note: Sub-titles are not captured in Xplore and should not be used

Cem Kaya
Faculty of Engineering and Natural Sciences: Computer Science and Engineering
Sabancı University

Baha Mert Ersoy
Faculty of Engineering and Natural Sciences: Computer Science and Engineering
Sabancı University
İstanbul, Turkey

Murat Karaca
Faculty of Engineering and Natural Sciences: Computer Science and Engineering
Sabancı University
İstanbul, Turkey

- Internship :
Ayşe Sena Acar

FHNW - Switzerland



[Home](#) ▶ [+](#) ▶ Schools ▶ FHNW School of Engineering... ▶ Institutes ▶ Institute for Interactive Technologies

Institute for Interactive Technologies

Digital interfaces for people and processes

- Aysun Öğüt
- Copenhagen,
Denmark



Aysun Ogut • 1st
MSc Student
2mo •

...

After waiting this moment for months, I have finally presented my very first paper in HCII2023! Being one of the highly attended sessions at the conference was invaluable.

I was also entitled to receive TÜBİTAK BİDEB support for my presentation.



HCI International 2023 Conference (HCII2023)



Aysun Ogut
"S284: Understanding User Perceptions and Behaviors in Privacy and Security"

Session with big attendance!

Thursday July 27, 2023 / 04:00 PM - 06:00 PM

Term Papers for Conferences



HCI INTERNATIONAL 2024

26TH INTERNATIONAL CONFERENCE ON
HUMAN-COMPUTER INTERACTION

Washington Hilton Hotel, Washington DC, USA

29 June - 4 July 2024

1984
2024

40 years of HCI International
Join us in Washington DC to celebrate



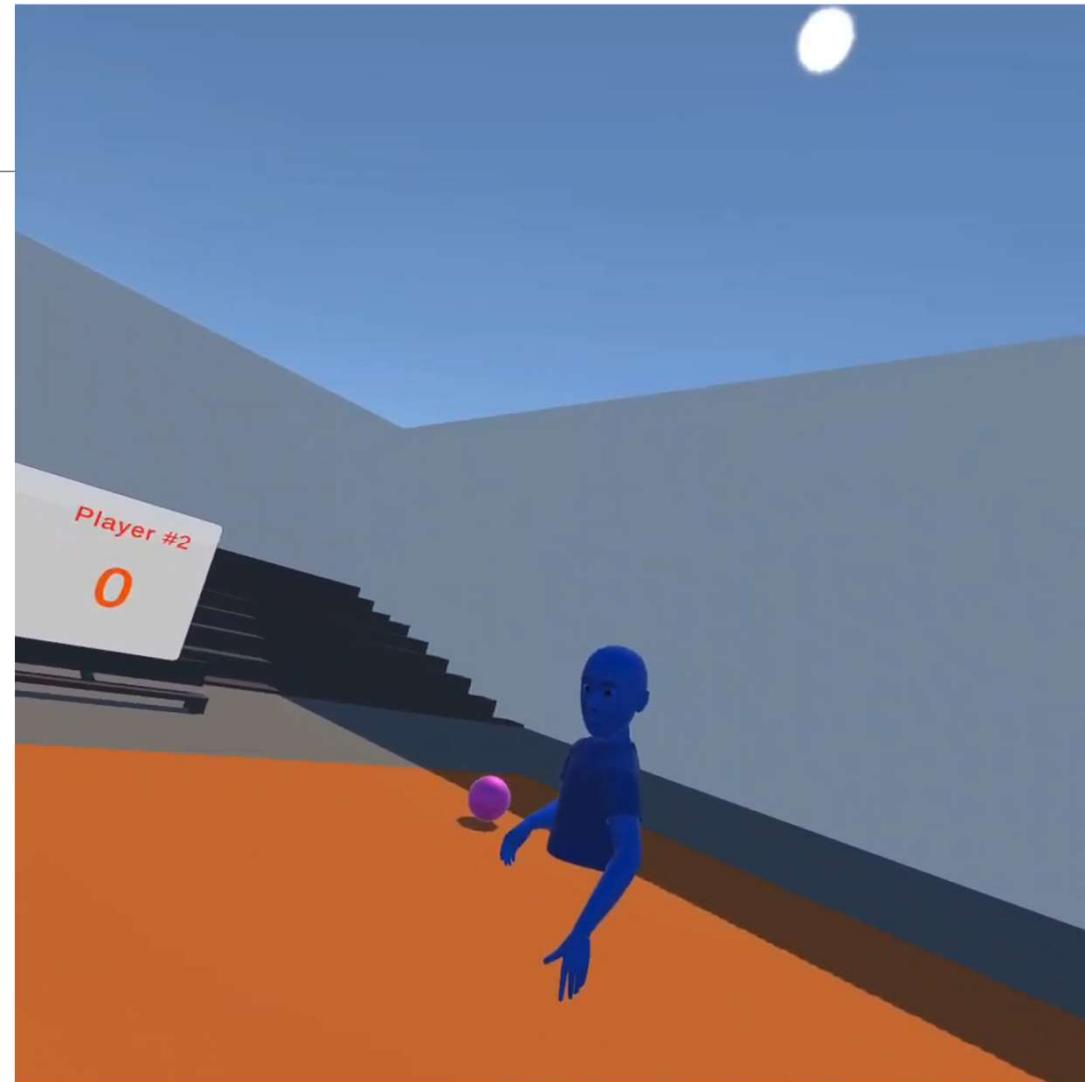
Welcome to International Conference on Artificial Intelligence and Human-Computer Interaction (ArtInHCI 2023)



中文/English

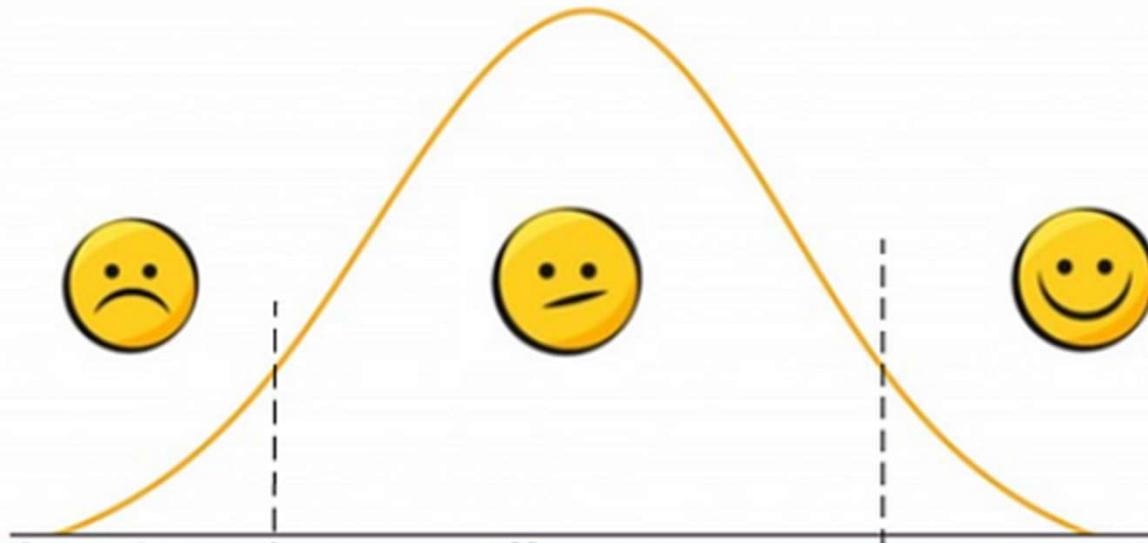


PURE projects

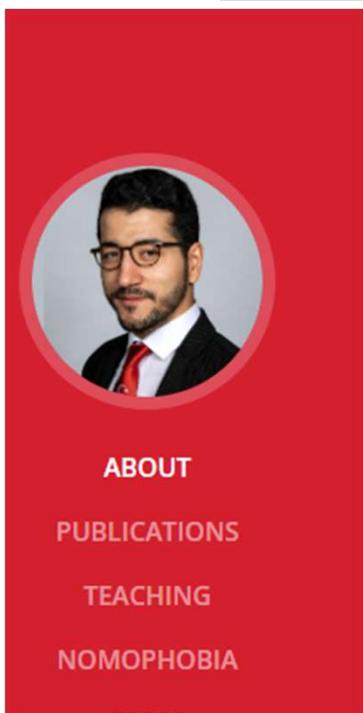


And Some Rumors About CS449 😊

- There is no exam, so it is a «kebap ders» : Yes or No
- referans koymayınca 10 puan kırabiliyo : Yes or No
- derste 2005'den kalma program kullandırıyor : Yes
- “HCI almayın kolay duran ameles işi dersi” : No comment 😊



Guest Speakers



ABOUT
PUBLICATIONS
TEACHING
NOMOPHOBIA
REFERENCES

CAGLAR YILDIRIM

HCI & MIXED REALITY | C.YILDIRIM@NORTHEASTERN.EDU | CAGLARY@MIT.EDU

I am a faculty member in the Khoury College of Computer Sciences at the Artificial Intelligence Laboratory at Massachusetts Institute of Technology. My research interests include HCI and Mixed Reality, and I work on projects to raise awareness on racial bias and discrimination. I received my PhD from the University of Southern California and was previously a faculty member in the Department of Computer Science at State University of New York at Albany.

My current research is in the areas of HCI and immersive environments, specifically focusing on how people interact with virtual/augmented/mixed reality environments. I am interested in understanding the complex interactions between humans and machines in these environments.

- designing and evaluating 3D interaction techniques for immersive environments
- studying human factors issues (e.g., cybersickness) in immersive environments
- and using machine learning techniques to quantify immersive environments



Mustafa Dalci · 1st

Founder / UX Consultant at Userspots, Co-Founder at IoX Digital
Talks about #ux, #uxdesign, and #entrepreneurship
Istanbul, Istanbul, Turkey · [Contact info](#)

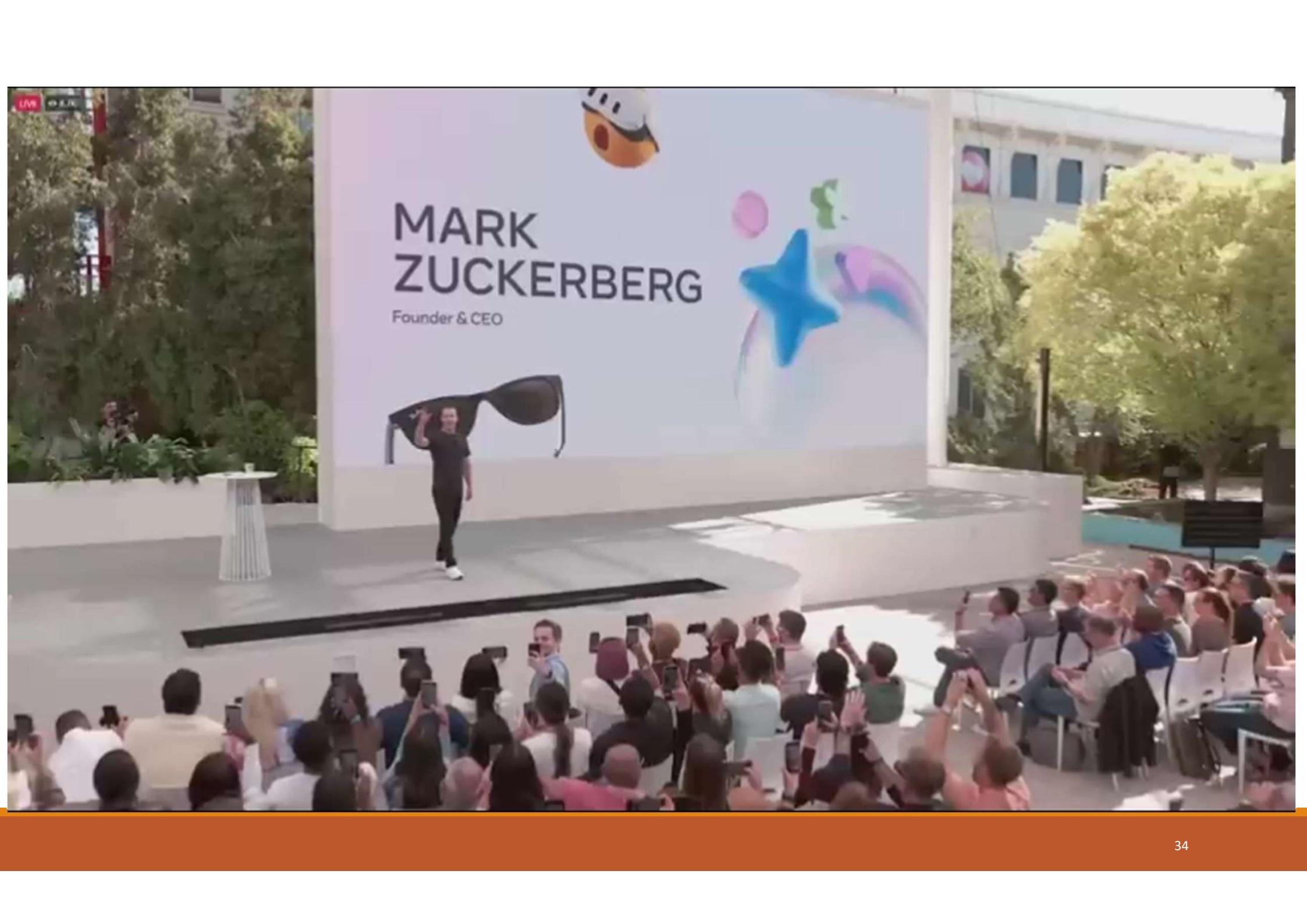
(maybe one UX expert from Google)

Who watched it?



Expanding reality, today and tomorrow

Join us virtually September 27 - 28, 2023



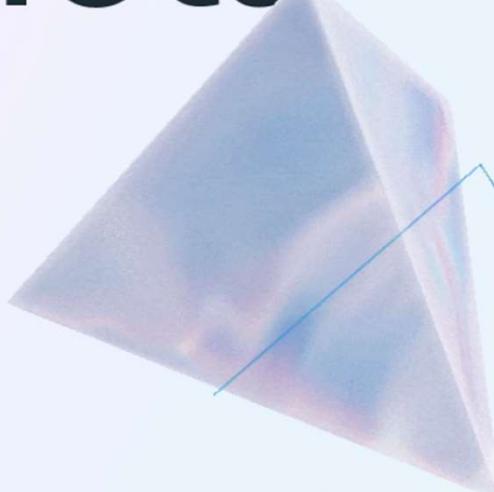
MARK ZUCKERBERG

Founder & CEO

[Connect 2024](#)[Program](#)[FAQ](#)[Register now](#)

meta.com/
connect/

Meta Connect 2024

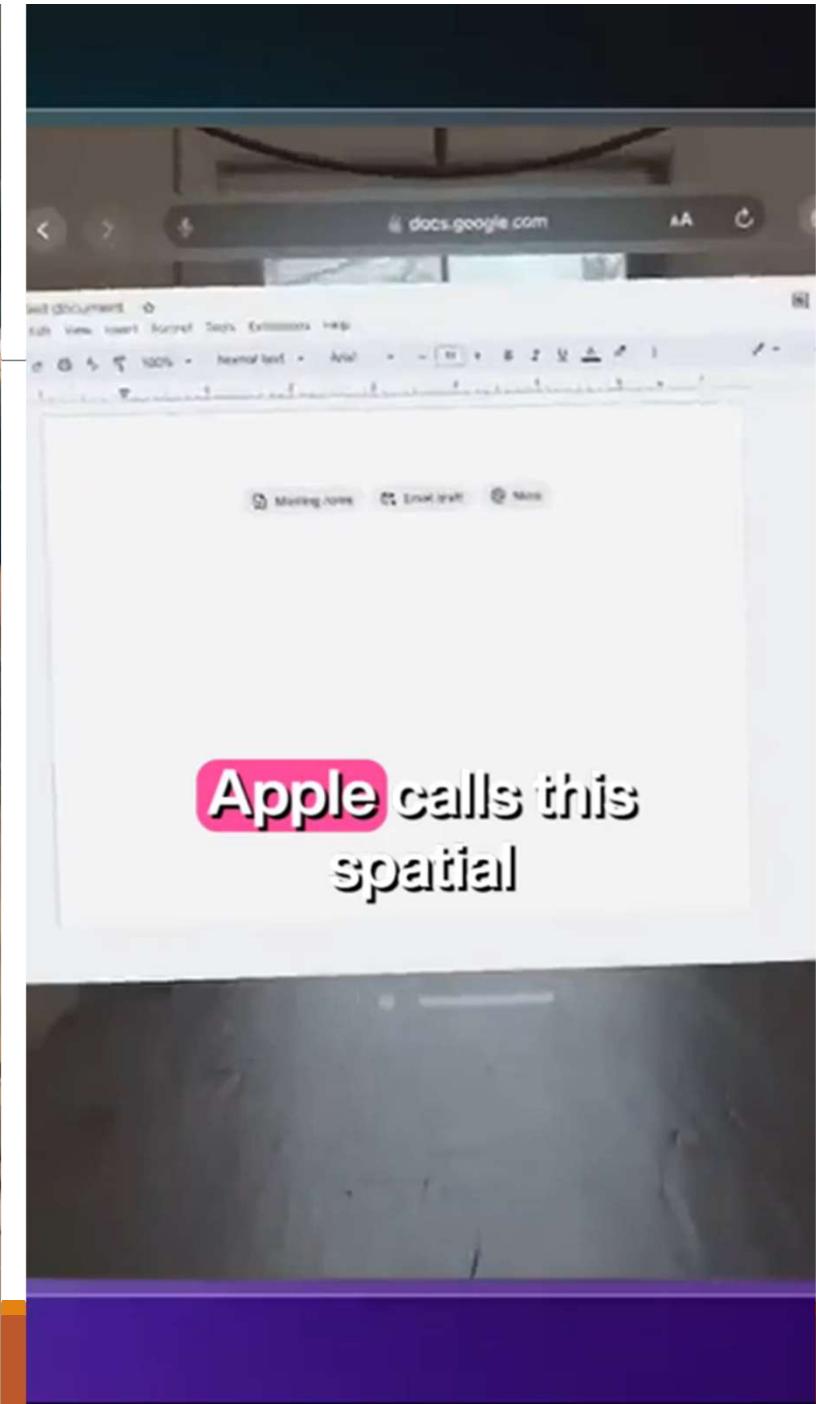


Meta Connect 2024
A two-day event featuring the technologies of the future.

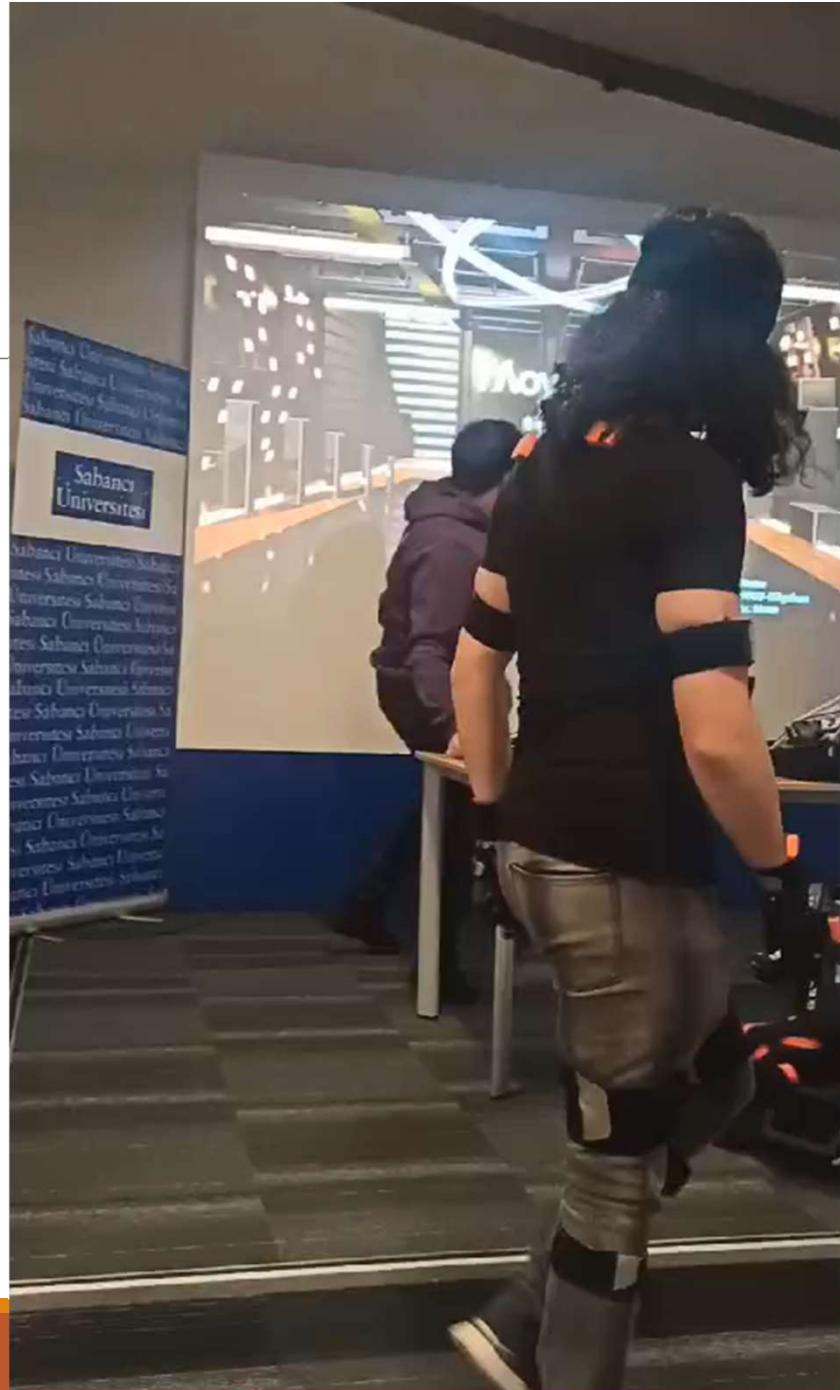
META CONNECT 2024

September 25-26

Spatial Computing



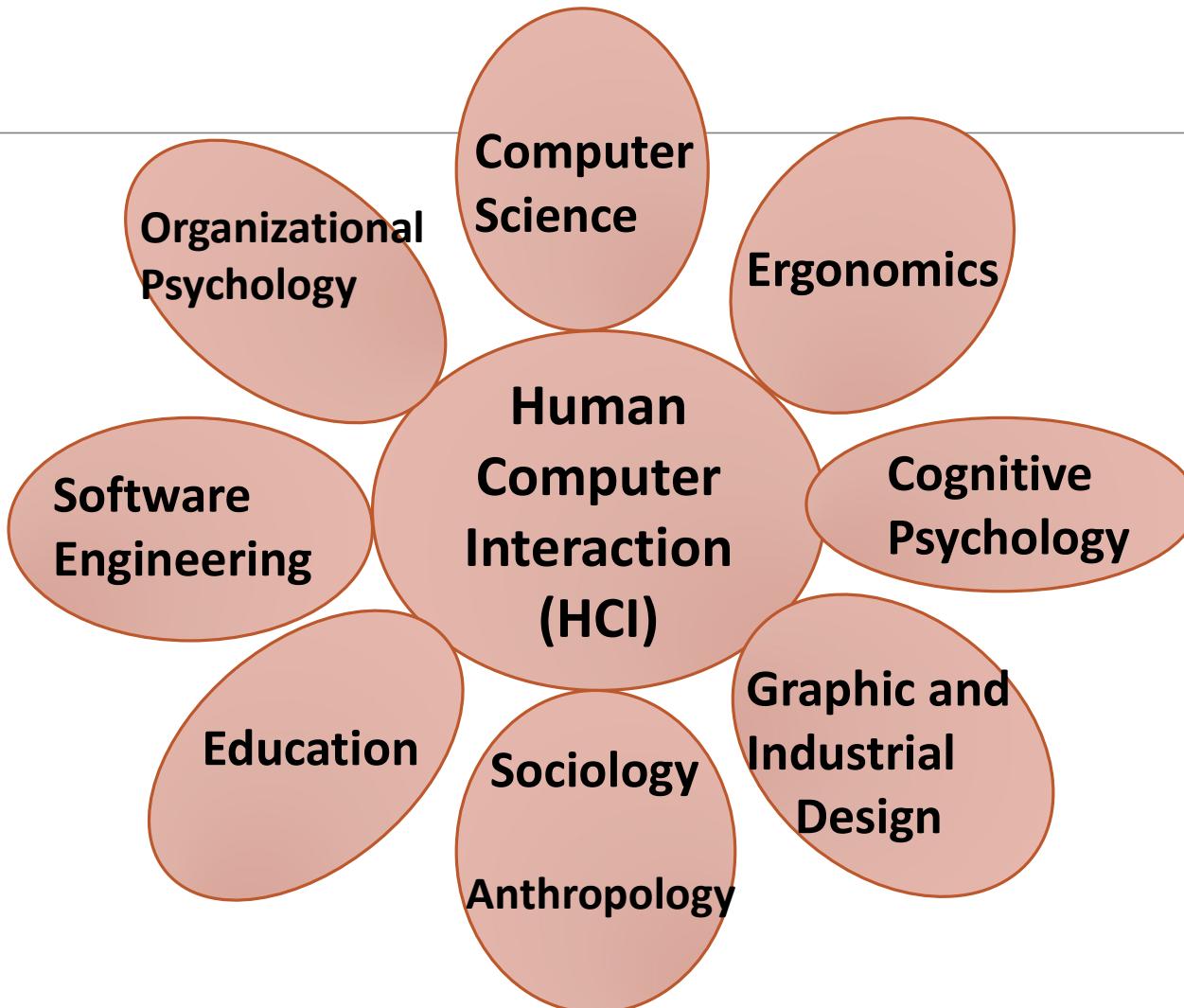
Wearable and Interaction



What is HCI?

- Interdisciplinary study of the design and use of interactive technologies,
- Aims to support the development of more usable and humanly acceptable systems
 - Interaction
 - Task based
 - User cognition
 - Organizational/social impact
 - The nature and the process of design
 - The nature of use
 - Communication

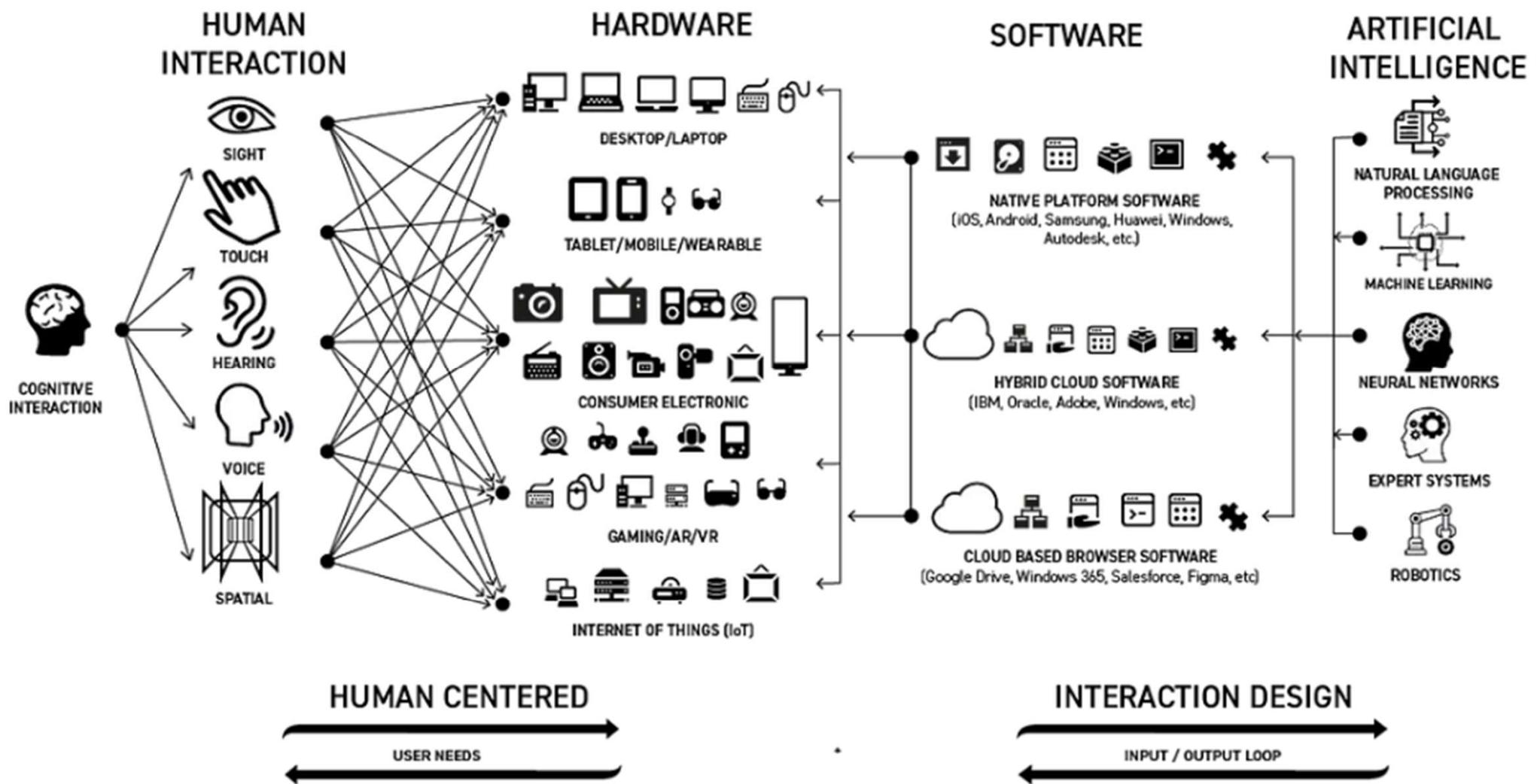
HCI is Inter/Transdisciplinary



HCI and SW Engineering

- 80% of total maintenance costs are related to user's problems with the system and not technical bugs. 64% are usability problems
- In developing interactive software, most software engineering methodologies do not propose mechanisms for:
 - explicitly and empirically identifying and specifying user needs and usability requirements, and
 - testing and validating requirements with end-users before, during, and after the development.
 - So, the developed systems generally meet all functional requirements, and yet are difficult to use with effectiveness, efficiency and satisfaction.

INTERACTION DESIGN PARADIGMS



HCI for All

- HCI for security
- HCI for health
- HCI for e-commerce
- HCI for computer games
- HCI for art
- HCI for education
- HCI for elderly
- HCI for robots
-

HCI for Defense – Eye tracking analysis of cockpit

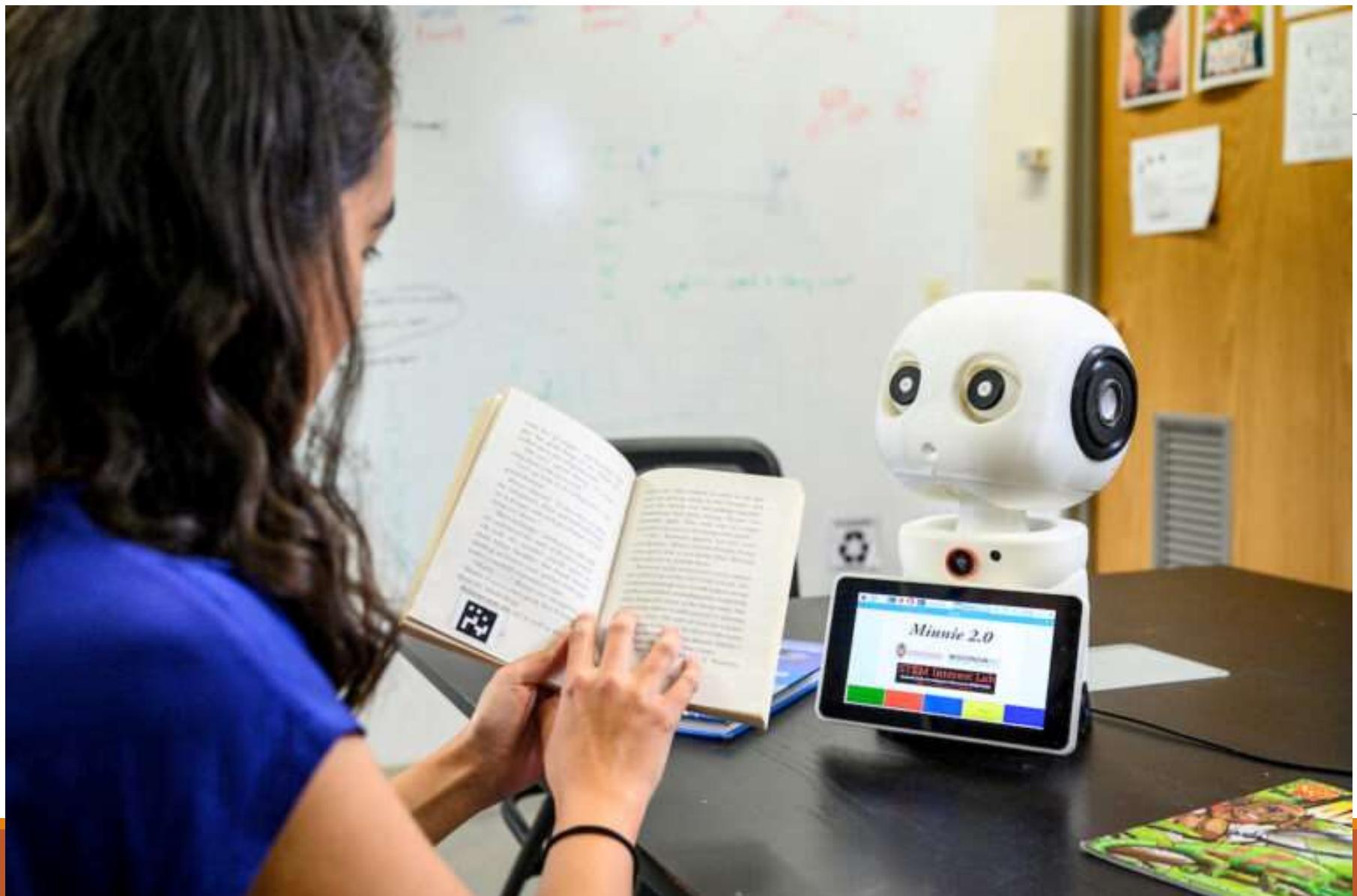
Before Take Off



After Take Off



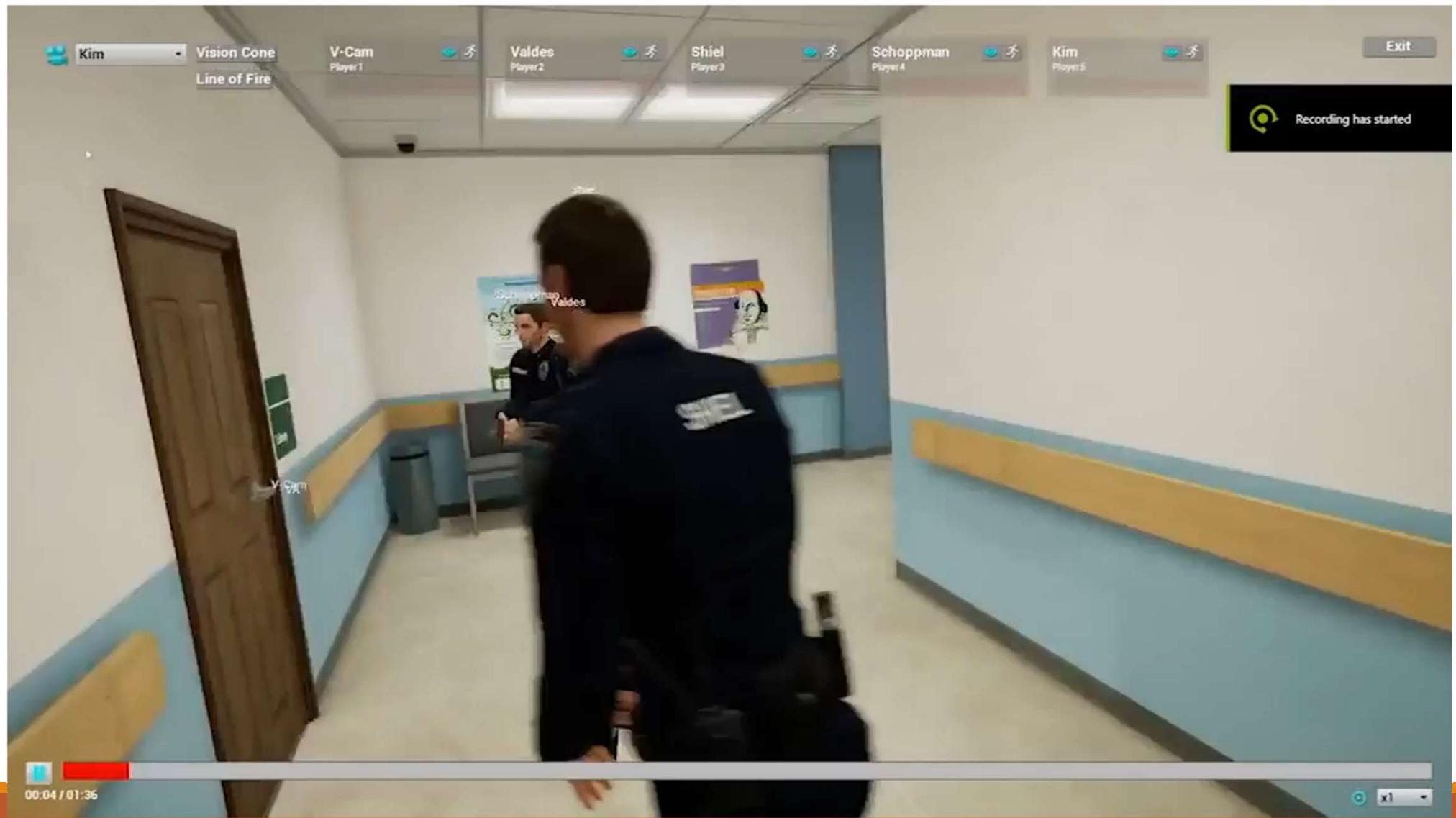
Human Robot Interaction



Human-Car Interaction



HCI for Security Training



HCI for e-commerce

Selbstauskunft: elbil, kamera, oversetter, translater, translator, dictionary, moped, el-moped, el-scooter, scooter, solcelle ryggsekk, el-sykkel, el sykkel, elektrisk sykkel, elbil, rc helikopter, rc produkter, el bil, ATV, elektrisk bil, el kjøretøy, elkjøretøy, el...

Dosya Düzen Görünüm Geçmiş Yerimleri Araçlar Yardım http://arngren.net/ Google elbil, kamera, oversetter, translater, ... Søk Arngren.net Slik Betaler du

www.ARNGREN.net

23 Butikker Teknologi & Gadgets Index el-retur

Frihjøf i sin Fly-Bil

Bygg ditt eget 2-seters Helikopter. Kr. 398.000,-

Kjøpsloven klick her. Angreskjema klick her.

Jagerfly Turbo-jet (6ch) fra kr. 1999,-

131 cm langt

Micro-Projektor (35 lum) m/Digital-avspiller & HD

Tilbud ! 2999,-

44 Språk-Talende Oversetter m/Norsk fra kr. 398,-

Spion-Kamera fra kr. 499,-

RC Flybil VTOL(3ch) fra kr. 249,-

LAND&AIR

Alle Produktene på denne siden lagerstøres hos ARNGREN i Oslo. Se Lagerkoden etter Prisene (lev. 2 - 5 dager): er på Lager Kommer før 3 uker lengre enn 3 uker

Forbruker Elektronikk Elektriske-Kjøretøy Disko-Lys Rakett-Fly Roboter Index

RC Produkter

120cm langt, Computer-styrte

Hummer el-Bil

Video-1 Video-2

RC 4ch Helikopter fra kr. 798,-

Rakett-Fly

Nyhet ! Robot-Arm

Avatar-Gunship 498,-

Elektrisk Hummer-H2 til barn & Ungdom fra 3.998,-

Elektronikk

El-Scooter & Bil Figurer Golf-biler (m/skilt) Hobby & RC Hoverpod HP-Måler (Bil) Isbitmaskin Kamera (trådløst) Kino (bærbar) Kompass (Bil/Båt) Laser-Jamer (Bil) Luft-Jekk Lykt (oppladbar) Mobil-telefon-1, 2 Motorsykkel-Mini Omformer (110V) Oversetter (44 språk) PC-mini (9"), 2

Ei-bil til Posten 79.998,-

Oppladbar-Lykt (15mill.) Verdens Sterkeste kr. 798,-

Laser-Show fra kr. 599,-

Tank 72 cm Lang kr. 998,-

Kikkert med Digital-Kamera & LCD skjerm

RC-Produkter

Nyhet !

Forbruker Elektronikk

Tilbud ! 100km/h

Gratis Mobiltel.-Spill

Web-kamera

RC-kamp-Helikopter sett

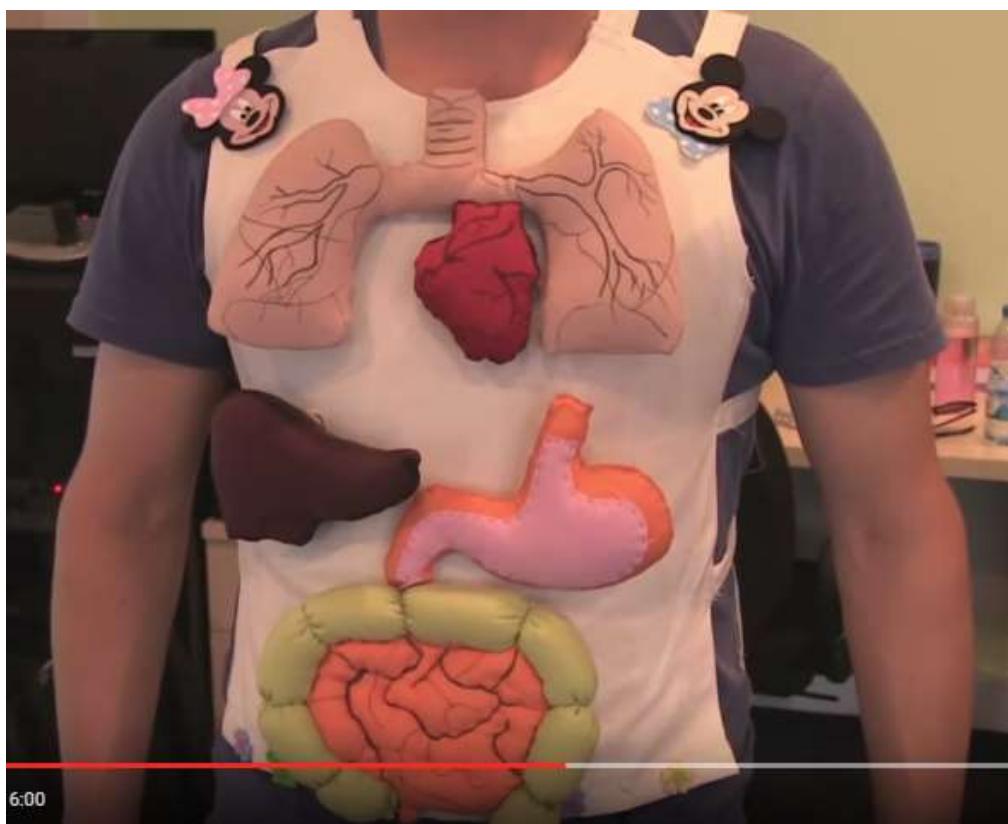
RC-kamp-Helikopter sett

Elektronikk Flysimulator! Gratis !

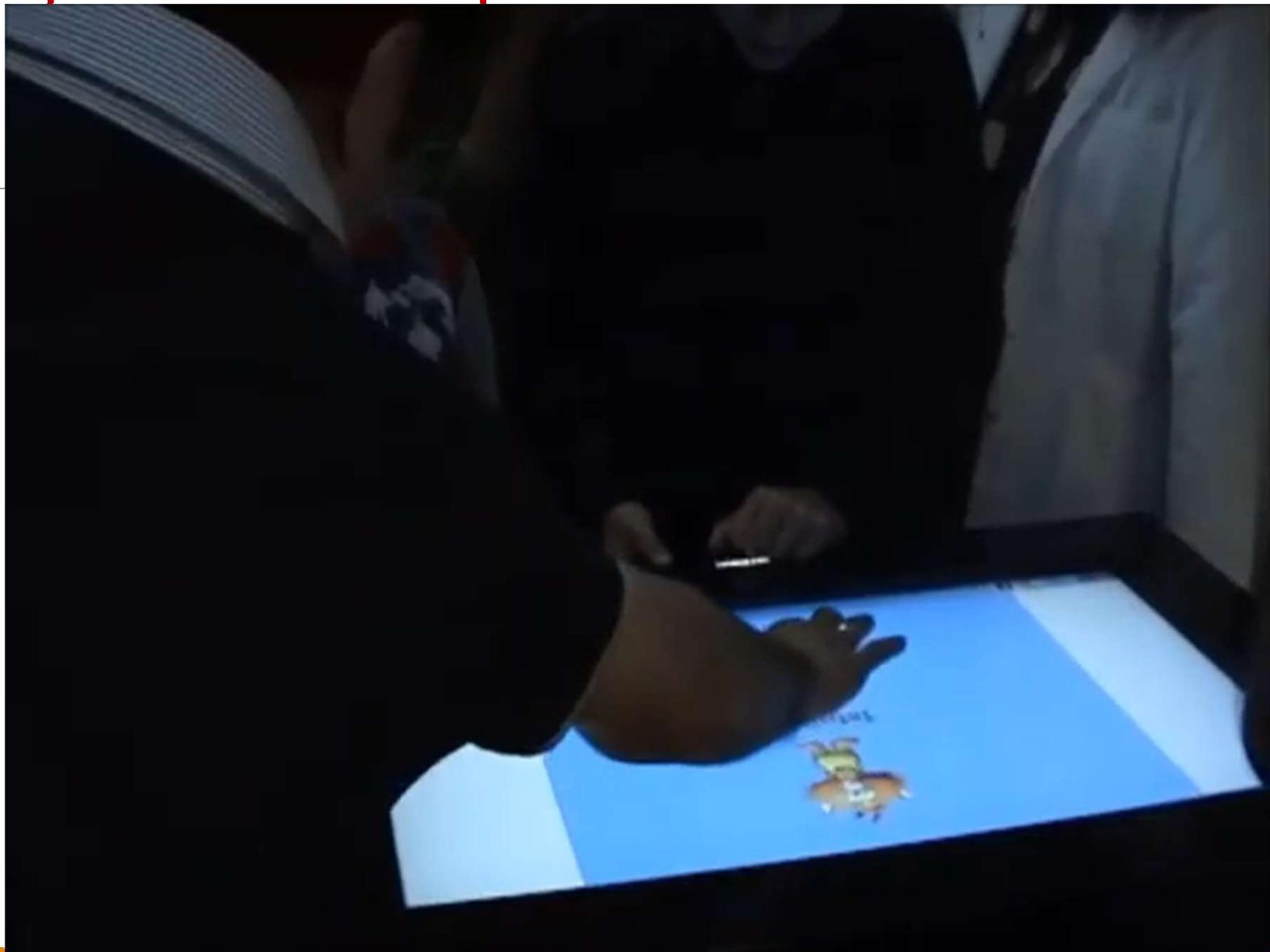
Elektronikk

Bitti

HCI for Education



HCI for Special People



HCI for Health Systems

- Therac-25
- Massive overdoses, 5 killed, several injured
- Technical design – UX design

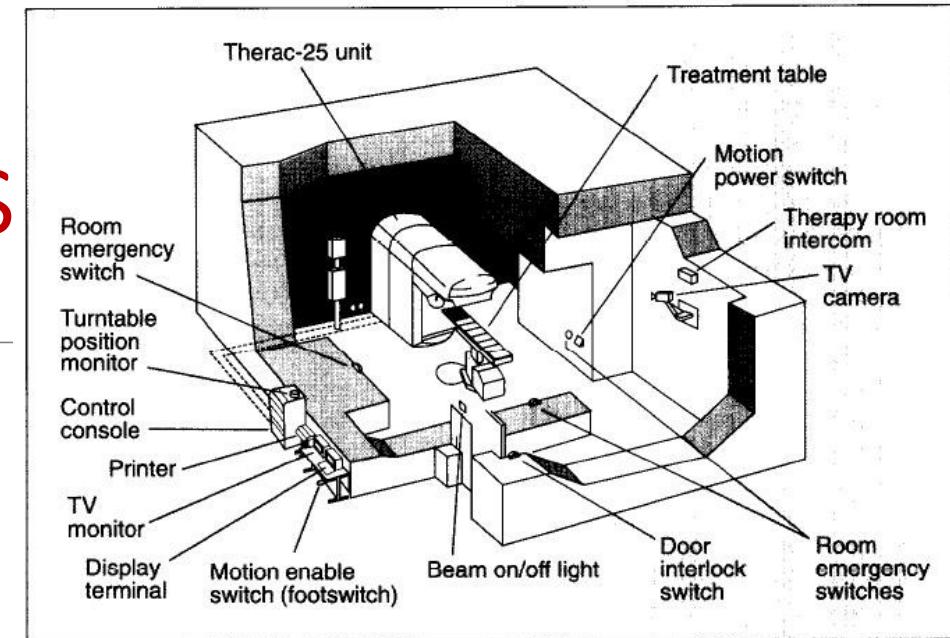
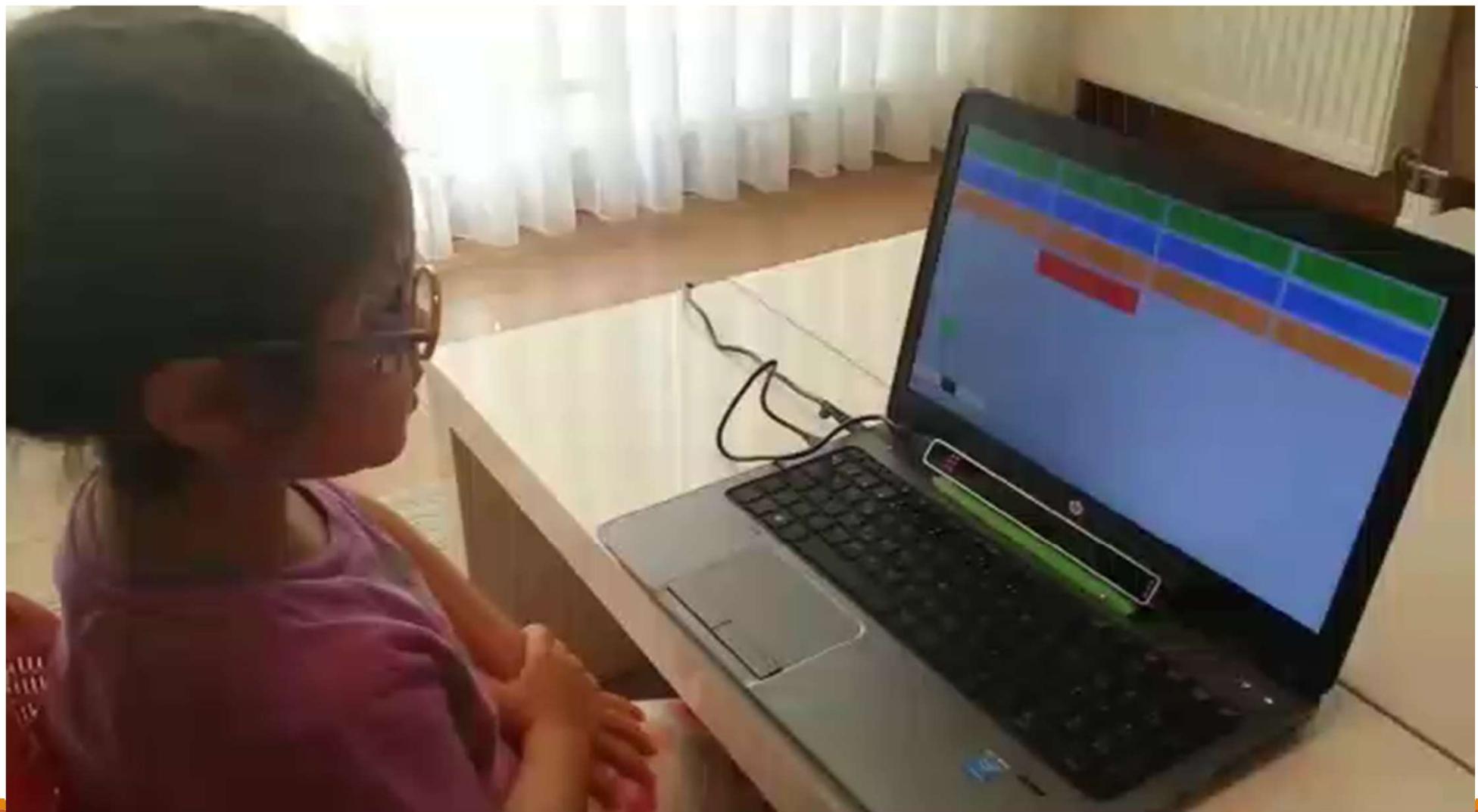


Figure 1. Typical Therac-25 facility.

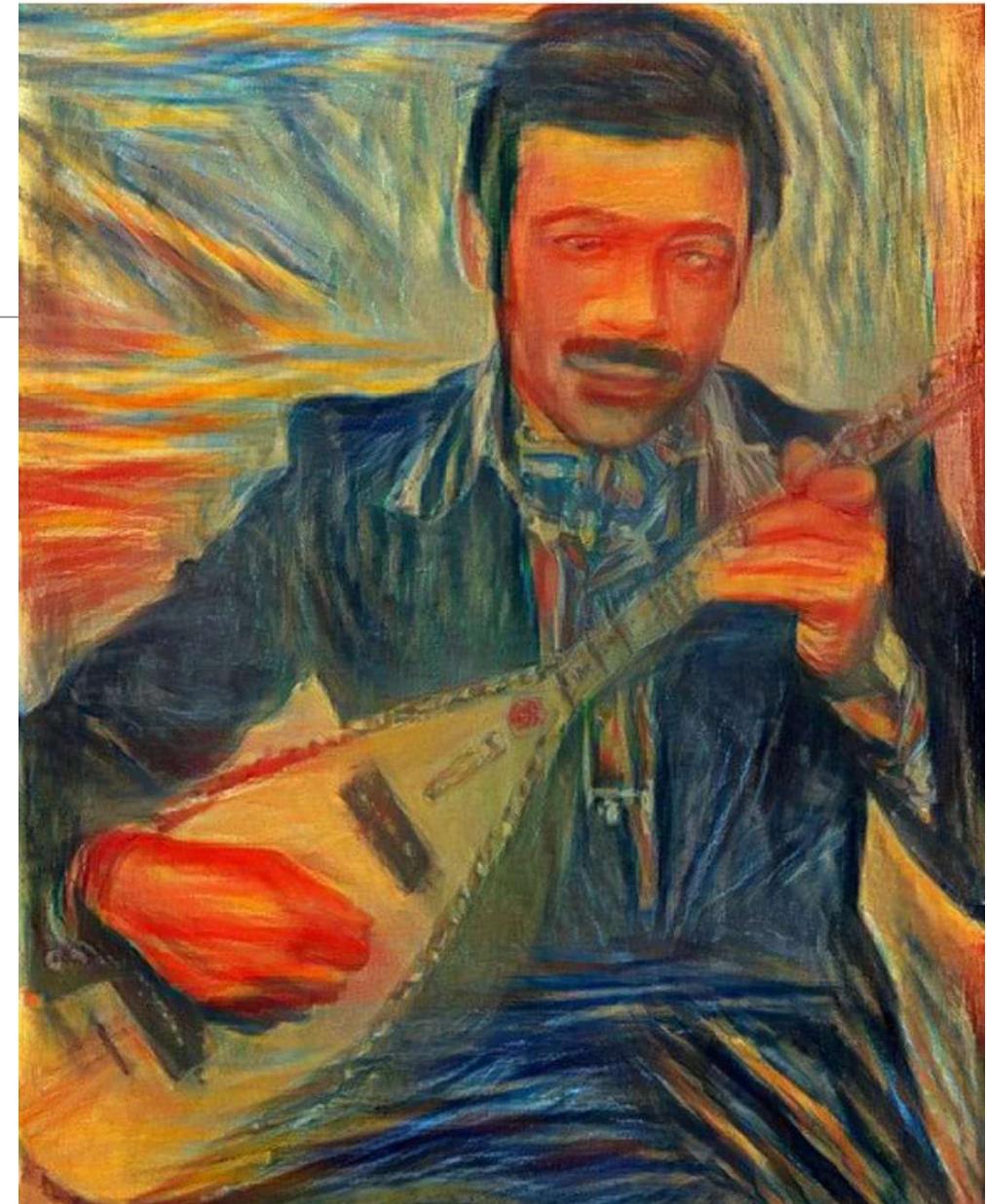


HCI for Games



HCI for Art

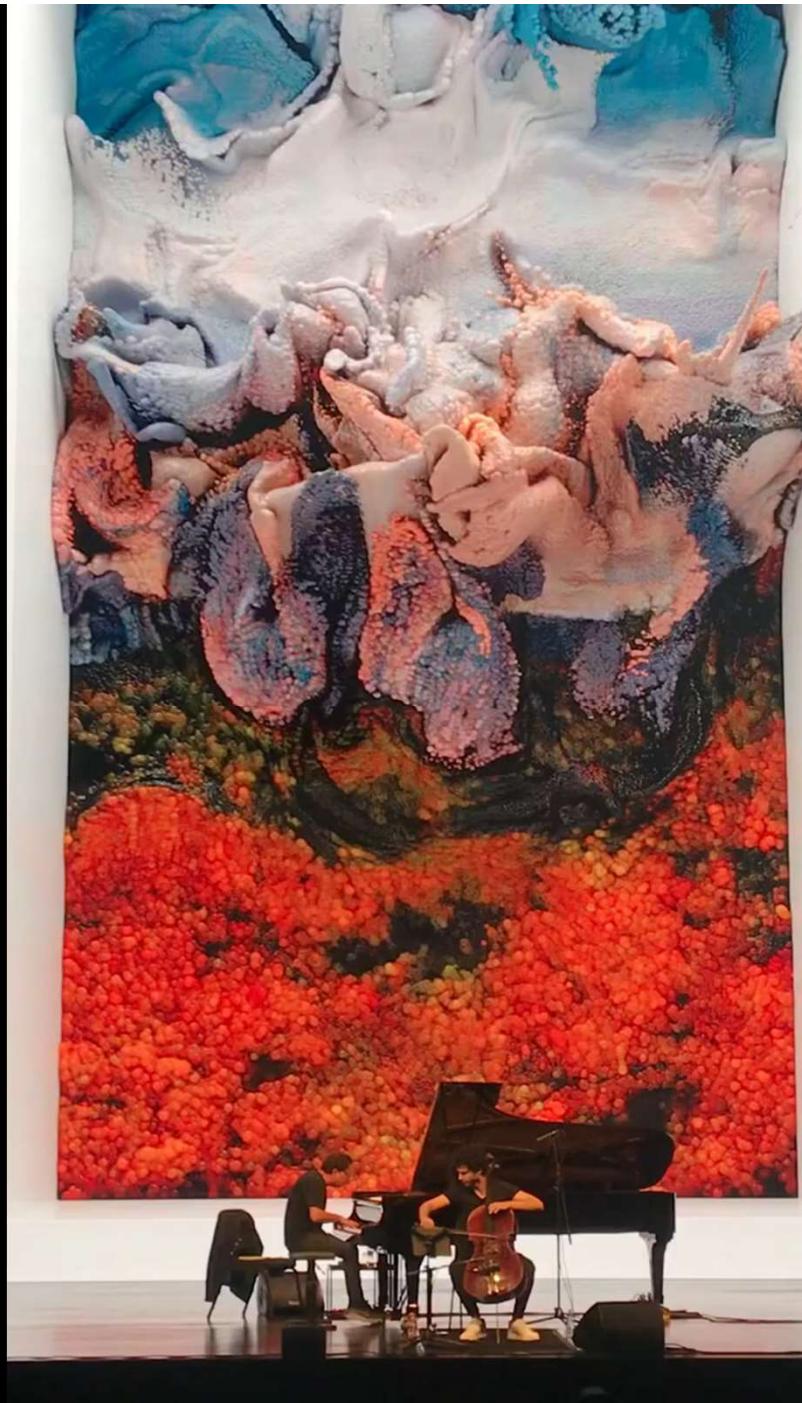
- Painter?
- <https://openai.com/dall-e-2/>



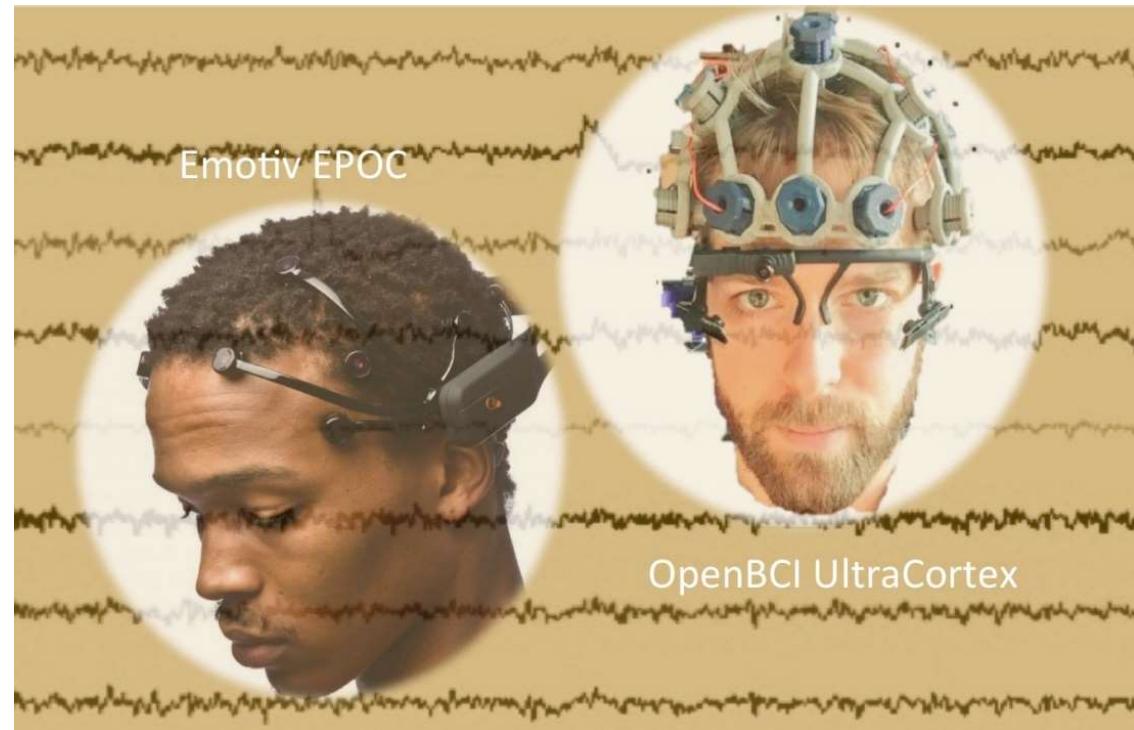
Fazıl Say

Refik Anadol

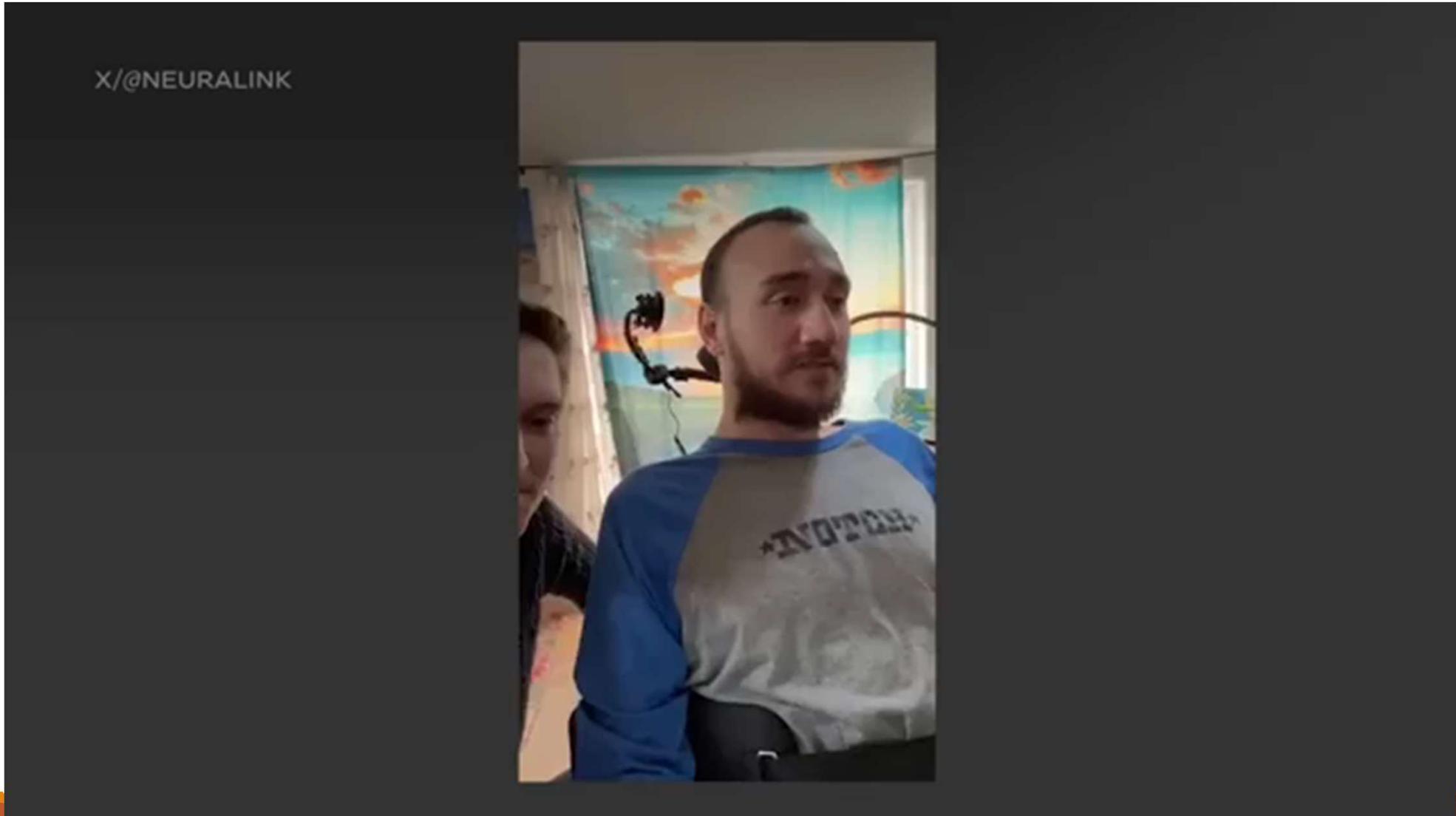
Jamal Aliyev



New Interfaces and Interaction



Brain Computer Interaction



New Interfaces and Interaction



Where do HCI People Work?

At Google, we follow a simple but vital premise: "Focus on the user and all else will follow." User Experience Researchers (UXRs) make this possible.



Senior UX Researcher, Google Cloud

Google

United States (Remote)

Senior UX Researcher, Google Cloud

Google · United States (Remote) 1 day ago · 10 applicants



\$152,000/yr - \$163,000/yr (LinkedIn est.) · Full-time · Mid-Senior level



10,001+ employees · Technology, Information and Internet



17 connections · 15 company alumni · 454 school alumni



See how you compare to 31 applicants. [Try Premium for free](#)



Actively recruiting

Apply ↗

Save



Principal UX Researcher

Microsoft

Washington, DC (Remote)

Principal UX Researcher

Microsoft · Washington, DC (Remote) 1 week ago · 42 applicants



Full-time · Associate



10,001+ employees · Software Development



17 connections · 7 company alumni · 463 school alumni



See how you compare to 42 applicants. [Try Premium for free](#)



Actively recruiting

you will work across products, disciplines, and organizations to establish a deep understanding of our customer challenges and opportunities to create a new set of experiential patterns within the M365 product suite



AR/VR User Experience Researcher
Apple
Cupertino, CA

AR/VR User Experience Researcher

Apple · Cupertino, CA 1 week ago · Over 200 applicants

Full-time

10,001+ employees · Computers and Electronics Manufacturing

As a member of our organization, you will drive exploration of future products that will delight, inspire, and empower millions of people.

- Design, plan and conduct user research, employing methods such as usability studies, Information Architecture (IA) studies, field studies, competitive evaluations, heuristic evaluations, surveys, and other relevant approaches



Senior User Experience Researcher
Hepsiburada (NASDAQ: HEPS)
Istanbul, Turkey (Hybrid)

Senior User Experience Researcher

Hepsiburada (NASDAQ: HEPS) · Istanbul, Turkey (Hybrid) 3 weeks ago · 90 applicants

 Full-time · Mid-Senior level

 1,001-5,000 employees · Technology, Information and Internet

 [Kullanıcı Deneyimi ve Tasarım Müdürü](#)
ebebek
Bostancı, Istanbul, Turkey (Hybrid)

 1 company alumnus works here



User Experience Researcher
n11
Istanbul, Turkey (Remote)

 Your profile matches this job

2 days ago ·  Easy Apply

*Technology
should be as
simple as the
box it comes in*
- PHILIPS

Easy to say,
Hard to Realize



**Technology should be as simple
as the box it comes in.**

Life is complicated enough. Technology shouldn't add to the problem. So Philips is committed to making technology that makes sense. Technology that's easy to use. Technology designed around the way you live and work. In other words, technology that's pure simplicity.

Join us on our journey at www.philips.com/simplicity

PHILIPS
sense and simplicity

Assignment-1: Design Diary

- Look for real life usability problems in interactive systems.
- Short (2-4 pages) analyses of a user issue with any interactive service - mobile, desktop or others (e.g. ATMs, kiosks, etc)
- Describe problem, analyze it in HCI terms, support your arguments with HCI literature (Mainly by Norman and Shneiderman)
- Recommend re-design option(s) with Figma RP

Design Diary Report Evaluation

- Relevance – is it an HCI design issue?
 - Description – can the reader foresee the issue clearly?
 - Theory – how does this issue relate to the literature on HCI?
 - Recommendation – how might the issue be resolved?
-
- Use Shneiderman, Norman, other resources for each heading.
 - E.g. Is it evaluation or execution problem? Does it violate Shneiderman's Eight Golden Rules? Does it violate Norman's Principles of Good Design

Readings for week-1

- **week-1-1** Introduction to HCI
 - Dix et.al. (2004). Human Computer Interaction. Introduction. pp. 1-8
- **Week-1-2** Evolution of HCI (skim through)
 - Grudin, J. (2012). Introduction: A Moving Target: The Evolution of Human–Computer Interaction
- **week-1-3** HCI Research Themes and Trends of past 60 Years (read only Discussion section)
 - Fatih Gurcan, Nergiz Ercil Cagiltay & Kursat Cagiltay (2021)
- **week-1-4** Shneiderman - Ch-1 usability of interactive systems (skim through)
 - Shneiderman, B. et.al. (2016). Usability of interactive systems. pp. 25-54.
- **Optional**
 - (In Turkish) Dolmuşun Kapısı by Aziz Nesin. A story in İstanbul'un Halleri - Read for fun
 - (In Turkish) Read for fun-2 Bilim-Teknik-elektronik_beyin_insan_konusmasi-1968-Ekim

Next Class

- History of the field. Reading #2
- Where do HCI go? Reading #3
- HCI basics. Reading #1&4